



Capital Cities Using Proportional Symbols

Subject Area

Geography

Suggested Level

Year 7-8

Overview

This classroom activity compares the size of Australia's capital cities and develops the use of proportional symbols to represent the data. Student worksheets are provided with the activity.

There are two opportunities for extension. For a more accurate representation of the data, proportional symbols may be drawn by making calculations of the areas of a square. A second option for extension involves the integration of the statistics into a geographic information system (GIS) in order to develop the skill of digital thematic mapping.

Requirements

- Geo_05 Student worksheet 1 and 2(Extension) : Using Proportional Symbols
- Calculator (optional, for extension only)
- Computer with GIS software program (optional, for extension only)

Instructions

Task One: How Many People live in our Capital cities?

1. Students use prior knowledge and Geo_05 Student Worksheet 1, to rank Australia's capital cities according to the size of their population.

See ranking below.

2. Students estimate the population of Australia's capital cities. See Table 1.

TABLE 1. RANK AND POPULATION OF AUSTRALIA'S CAPITAL CITIES			
Capital City Statistical Divisions	(a) Rank (1-8) according to the size of population.	(b) Estimate the population of Australian capital cities.	(c) Population Capital City Statistical Division, June 2008
Adelaide	5		1,172,105
Brisbane	3		1,945,639
Canberra	6		345,257
Darwin	8		120,652



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Greater Hobart	7		209,287
Melbourne	2		3,892,419
Perth	4		1,602,559
Sydney	1		4,399,722
Total population in capital cities			13,687,640

Source: Table 7.15, [Year Book Australia, 2009-10](#) (cat. no. 1301)

- Provide the students with the population of each capital city and ask them to complete column (c) in Table 1 on Worksheet 1.
- Students use the values in column (c) to find the total population of Australia's eight capital cities. (**Answer provided in Table 1**)
- Students calculate the percentage of the Australian population living in the capital cities. They do this using the values in column (c) and the population of Australia provided at the start of Worksheet 1. (**Answer is 61%**).
- Students consider the advantages and disadvantages for Australia of having a large percentage of the population living in just 8 cities.

Discuss with students the positive (easier to provide services and infrastructure, easy access to jobs) and negative (increased land values in capitals, congestion, and marginalisation of rural communities) aspects of this value.

- Using the map provided, students represent the population of each capital city with a proportional symbol. They should provide BOLTSS (border, orientation, legend, scale and source) for the map.

Extension: Drawing Accurate Proportional Symbols

For extension, students work more accurately.

They represent the population of each capital city with a square whose area is proportional to the size of the population.

Area of square (L^2): Population of capital city (P)

Length of side (L): $\sqrt{P}$

Students choose an appropriate scale for the squares representing the population of each capital city. An appropriate scale for the A4 map provided would be 1mm = 100 people and therefore a square of 1cm x 1 cm would represent 1,000,000 people.

Table 2 provides the answers for the calculations in [Geo_05 Student Worksheet 2: Extension](#).

TABLE 2. CALCULATIONS FOR PROPORTIONAL SYMBOLS TO REPRESENT THE POPULATION OF AUSTRALIA'S CAPITAL CITIES			
Capital City	Population (P) Capital City	Square root of Population	Possible Scale for A4 Map (1mm represents 100 people)



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	Statistical Division, June 2008	$\sqrt{\text{Population}}$	Represent the population with a square whose side is
Adelaide	1,172,105	1,082.6	10.8mm
Brisbane	1,945,639	1,394.9	13.9mm
Canberra	345,257	587.6	5.9mm
Darwin	120,652	347.3	3.5mm
Greater Hobart	209,287	457.5	4.6mm
Melbourne	3,892,419	1,972.9	19.7mm
Perth	1,602,559	1,265.9	12.7mm
Sydney	4,399,722	2,097.6	21.0mm

Source: [Year Book Australia, 2009-10](#), Table 7.15 (cat. no. 1301)

Example: Adelaide

Population = 1,172,105

Length of side of square = $\sqrt{1,172,105} = 1,082.6$

If 1 mm represents 100 people then Adelaide would be represented by a square with side length of 10.8mm.

Further extension is available using geographic information system software.

Glossary

Estimated Resident Population (ERP):

Is the count of all people regardless of citizenship and nationality, who usually live in Australia, with the exception of foreign diplomats and their families. It is the official measure of the Australian population.

Proportional symbols

Symbols used on a map where the size of the symbol is proportional to the value it represents.

References

(Note: Links to ABS publications are to the most recent release. Previous releases can be accessed by selecting the 'Past & Future Releases' tab.)

[Year Book Australia, 2009-10](#) (cat. no. 1301.0)

GEO 05-Teacher: Population of Australian



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Feedback

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